

Notice of Allowability	Application No.	Applicant(s)	
	10/063,473	BOSKAMP, EDDY BENJAMIN	
	Examiner	Art Unit	
	Dixomara Vargas	2859	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to Amendment filed on 05/18/04.
2. ☒ The allowed claim(s) is/are 1-31.
3. ☒ The drawings filed on 11 June 2002 are accepted by the Examiner.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☐ All b) ☐ Some* c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
 6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

- | | |
|---|---|
| <ol style="list-style-type: none"> 1. <input type="checkbox"/> Notice of References Cited (PTO-892) 2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) 3. <input type="checkbox"/> Information Disclosure Statements (PTO-1449 or PTO/SB/08),
Paper No./Mail Date _____ 4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit
of Biological Material | <ol style="list-style-type: none"> 5. <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) 6. <input type="checkbox"/> Interview Summary (PTO-413),
Paper No./Mail Date _____ 7. <input checked="" type="checkbox"/> Examiner's Amendment/Comment 8. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance 9. <input type="checkbox"/> Other _____ |
|---|---|

DETAILED ACTION

EXAMINER'S AMENDMENT

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Sean F. Sullivan on July 15, 2004.

In the claims:

Replace claim 1 with the following:

1. An apparatus for magnetic resonance imaging, comprising: a degenerate birdcage coil configured within a magnetic resonance imaging apparatus having a pair of opposing rings and a plurality of rungs positioned circumferentially around said pair of rings; an input excitation circuitry for applying excitation radio frequency (RF) energy to said degenerate birdcage coil at a first resonance mode thereof; and an output receiving circuitry for receiving RF energy emitted by an object positioned within said degenerate birdcage coil, said output receiving circuitry receiving said emitted RF energy at a plurality of resonance modes at a single frequency of said degenerate birdcage coil, including said first resonance mode; wherein said output receiving circuitry is configured to independently read each of said plurality of resonance modes with respect to one another.

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Replace claim 7 with the following:

7. A degenerated birdcage resonator for magnetic resonance imaging, comprising: a pair of opposing rings and a plurality of rungs positioned circumferentially around said pair of rings; means for applying excitation radio frequency (RF) energy to the degenerate birdcage resonator configured within a magnetic resonance imaging apparatus such that a homogeneous RF field is establish within the degenerate birdcage resonator; and means for independently reading each of a plurality of resonance modes of RF energy at a single frequency received by the degenerate birdcage resonator from an object placed therewithin.

Replace claim 19 with the following:

19. A method for implementing a degenerate birdcage resonator within a magnetic resonance system, the method comprising: applying excitation radio frequency (RF) energy to the degenerate birdcage resonator within the magnetic resonance imaging system such that a homogeneous RF field is established within the degenerate birdcage resonator; and independently reading each of a plurality of resonance modes of RF energy at a single frequency received by the degenerated birdcage resonator from an object placed therewithin.

Replace claim 25 with the following:

25. A method for implementing a degenerate birdcage resonator within a magnetic resonance system, the method comprising: sinusoidally applying excitation

radio frequency (RF) energy to individual rungs of the degenerate birdcage resonator within the magnetic resonance imaging system at a first resonance mode thereof, such that a homogeneous RF field is established therewithin; and independently reading each of a plurality of resonance modes of RF energy at a single frequency, including said first resonance mode, received by the degenerated birdcage resonator from an object placed therewithin.

Allowable Subject Matter

2. Claims 1-31 are allowed.
3. The following is an examiner's statement of reasons for allowance:
 - a. With respect to claim 1, the claim has been found allowable over the prior art of record because the prior art of record fails to teach or fairly suggest an apparatus for MRI comprising: an output receiving circuitry receiving RF energy at a plurality of resonance modes at a single frequency and wherein said circuitry is configured to independently read each of the resonance modes in combination with the remaining limitations of the claim.
 - b. With respect to claim 7, the claim has been found allowable over the prior art of record because the prior art of record fails to teach or fairly suggest a degenerate birdcage resonator for MRI comprising: means for independently reading each of a plurality of resonance modes of RF energy at a single frequency in combination with the remaining limitations of the claim.

- c. With respect to claim 13, the claim has been found allowable over the prior art of record because the prior art of record fails to teach or fairly suggest an MRI system comprising: an output receiving circuitry receiving RF energy at a plurality of resonance modes at a single frequency and wherein said circuitry is configured to independently read each of the resonance modes in combination with the remaining limitations of the claim.
- d. With respect to claims 19 and 25, the claims have been found allowable over the prior art of record because the prior art of record fails to teach or fairly suggest a method for implementing a degenerate birdcage resonator within a MRI system, the method comprising the step of: independently reading each of a plurality of resonance modes of the RF energy at a single frequency received by the resonator in combination with the remaining limitations of the claim.
- e. With respect to claims 2-6, 8-12, 14-18, 20-24 and 26-31, the claims have been found allowable over the prior art of record due to its dependencies on claims 1, 7, 13, 19 and 25 above.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

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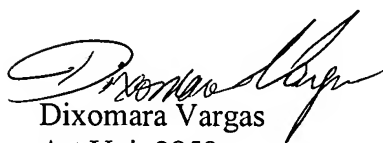
Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dixomara Vargas whose telephone number is (571) 272-2252.

The examiner can normally be reached on 8:00 am. to 4:30 pm..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Diego Gutierrez can be reached on (571) 272-2245. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Dixomara Vargas
Art Unit 2859
July 15, 2004



Diego Gutierrez
Supervisory Patent Examiner
Technology Center 2800